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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/495,552	02/01/2000	Robert L. Thornton	SIROS-99027A	5007

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DISCOVISION ASSOCIATES
INTELLECTUAL PROPERTY DEVELOPMENT
2355 MAIN STREET, SUITE 200
IRVINE, CA 92614

EXAMINER	
LE, KIMLIEN T	

ART UNIT	PAPER NUMBER
2653	15

DATE MAILED: 05/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/495,552	Applicant(s) THORNTON ET AL.	
	Examiner Kimlien T Le	Art Unit 2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5 and 22-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,22 and 25-27* is/are rejected.

7)☒ Claim(s) *23,24 and 28-35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☑ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on March 08, 2004 have been fully considered but they are not deemed to be persuasive.

Applicant asserts on page 10 :

"Claims 1, 2, and 5 of the present invention recites a "solid state laser" and an "integral slider fabricated from a single, monolithic semiconductor substrate."

The Examiner maintains that Awano et al (U.S. Patent 6, 657,927) discloses an optical head apparatus comprising at least one solid state laser and an integral slider, the solid state laser and integral slider fabricated from a single, monolithic semiconductor substrate (Abstract of Awano et al.).

Moreover, Applicant asserts on page 11 :

" Claim 22 recites to a "semiconductor substrate" including at least one "laser region" and a "slider region". In contrast to the present invention, Ukita et al. discloses on page 5561 an "integrated flying optical head.... That is, the LD and slider are two separate components attached to each other."

The Examiner maintains that Awano et al (U.S. Patent 6, 657,927) discloses an optical head apparatus comprising at least one solid state laser and an integral slider, the solid state laser and integral slider fabricated from a single, monolithic semiconductor substrate (Abstract of Awano et al).

Furthermore, Applicant asserts on page 14:

"Claim 27 which is dependent on independent claim 22 is patentable for the same reason as claim 22. Furthermore, claim 27 recites to an air bearing surface comprising a protective layer comprising a material, one of which can be diamond-like carbon".

The Examiner maintains that Hajjar (U.S. Patent 6,009,064) discloses an air bearing surface comprising a protective layer comprising a material, one of which can be diamond-like carbon (column 8, lines 53-65).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Awano et al (U.S. Patent 6, 657,927).

Regarding claim 1, see Fig. 3 of Awano et al which shows an optical head apparatus comprising at least one solid state laser and an integral slider, the solid state laser and integral slider fabricated from a single, monolithic semiconductor substrate (Abstract).

Regarding claim 2, see Figs. 3 of Awano et al which shows an optical head apparatus comprising a single semiconductor substrate, the semiconductor substrate structured and configured to define at least one solid state laser and a slider, the solid state laser integral with the slider (Abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hopkins et al (U.S. Patent 5, 625,617) and further in view of Awano et al (U.S. Patent 6, 657,927).

Regarding claim 3, see Fig. 13 of Hopkins et al which shows the optical head apparatus comprising the solid state laser (136) includes an emission facet and the slider (132) includes an air bearing surface (inherent), the emission facet substantially co-planar with the air bearing surface (column 10, lines 17-30). Hopkins et al does not show the integral laser region and slider region defining a monolithic optical head. However, Awano et al teaches the integral laser region and slider region defining a monolithic optical head (Abstract). Therefore, it would have been obvious to provide Hopkins et al with the integral laser region and slider region defining a monolithic optical head as taught by Awano et al. The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide Hopkins et al with the integral laser region and slider region defining a monolithic optical head as taught by Awano et al, in order to avoid complex, difficult and expensive mechanical attachment procedures for securing solid state lasers to slider.

Regarding claim 5, see Fig. 13 of Hopkins et al which shows the optical head apparatus comprising a slider portion (132) having an air bearing surface (inherent) thereon, the

semiconductor substrate including at least one laser portion (136) having an emission face, the emission face substantially coplanar with the air bearing surface (column 10, lines 17-30). Hopkins et al does not show the integral laser region and slider region defining a monolithic optical head. However, Awano et al teaches the integral laser region and slider region defining a monolithic optical head (Abstract). Therefore, it would have been obvious to provide Hopkins et al with the integral laser region and slider region defining a monolithic optical head as taught by Awano et al. The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide Hopkins et al with the integral laser region and slider region defining a monolithic optical head as taught by Awano et al, in order to avoid complex, difficult and expensive mechanical attachment procedures for securing solid state lasers to slider.

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Awano et al (U.S. Patent 6, 657,927), and further in view of Claisse et al. (U.S. Patent 5,917,848).

Regarding claim 4, see Fig. 3 of Awano et al that shows all the features of claim 4 except for the solid state laser that is a vertical cavity surface emitting laser. However, Claisse et al. teaches that the solid state laser is a vertical cavity surface emitting laser (column 1, lines 14-20). Therefore, it would have been obvious to provide Awano et al with the vertical cavity surface emitting laser as taught by Claisse et al. The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide Awano et al with the vertical cavity surface emitting laser as taught by Claisse et al, in order to provide a highly compact VCSEL structure which can be used to define the lasting aperture of a laser structure.

5. Claims 22, 25 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ukita et al (Applications of an extremely short strong- feedback configuration of an external-cavity laser diode system fabricated with GaAS- based integration technology) and further in view of Awano et al (U.S. Patent 6, 657,927).

Regarding claim 22, see Figs. 5 of Ukita et al which show a near-field optical apparatus comprising a semiconductor substrate, the semiconductor substrate including at least one laser region, the semiconductor substrate including a slider region (pages 5560- 5561). Ukita et al does not show the integral laser region and slider region defining a monolithic optical head. However, Awano et al teaches the integral laser region and slider region defining a monolithic optical head (Abstract). Therefore, it would have been obvious to provide Ukita et al with the integral laser region and slider region defining a monolithic optical head as taught by Awano et al. The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide Ukita et al with the integral laser region and slider region defining a monolithic optical head as taught by Awano et al, in order to avoid complex, difficult and expensive mechanical attachment procedures for securing solid state lasers to slider.

Regarding claim 25, see Figs. 5 of Ukita et al which show a near-field optical apparatus of claim 22, wherein the slider includes an air bearing surface (page 5561).

Regarding claim 32, see Figs. 5 of Ukita et al. which show the near-field optical apparatus of claim 22, wherein the laser includes an emission facet having an aperture therein (page 5560).

6. Claims 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ukita et al (Applications of an extremely short strong- feedback configuration of an external-cavity laser

diode system fabricated with GaAS- based integration technology) and Awano et al (U.S. Patent 6, 657,927) and further in view of Hopkins et al.(U.S. Patent 5,625,617).

Regarding claims 33-35, Ukita et al in view of Awano et al show all the features of claim 33-35, except for the semiconductor laser having an output wavelength λ, and the aperture has a width w such that $w < \lambda/2$. However, Hopkins et al. teaches that the semiconductor laser having an output wavelength λ, and the aperture has a width w such that $w < \lambda/2$ (Abstract). Therefore, it would have been obvious to provide Ukita et al in view of Awano et al with the semiconductor laser having an output wavelength λ, and the aperture having a width w such that $w < \lambda/2$ as taught by Hopkins et al. The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide Ukita et al in view of Awano et al with the semiconductor laser having an output wavelength $\lambda/2$, and the aperture having a width w such that $w < \lambda/2$ as taught by Hopkins et al., such that the light emission is largely confined to a first region of the emission face.

7. Claims 26- 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ukita et al (Applications of an extremely short strong- feedback configuration of an external-cavity laser diode system fabricated with GaAS- based integration technology) and Awano et al (U.S. Patent 6, 657,927) and further in view of Hajjar (U.S. Patent 6,009,064).

Regarding claims 26 and 27, Ukita et al in view of Awano et al show all the features of claim 26 and 27, except for the protective layer comprising a material selected from the group consisting of metal nitride, metal carbide, metal, metal alloy, Group III nitride, Group IV nitride, Group III carbide, Group IV carbide, diamond, diamond-like carbon, hydrogenated carbon, fluoride, and fluoropolymer. However, Hajjar teaches that the protective layer comprises a

material selected from diamond-like carbon (column 8, lines 53-65). Therefore, it would have been obvious to provide Ukita et al in view of Awano et al with the protective layer of diamond-like carbon as taught by Hajjar. The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to provide Ukita et al in view of Awano et al with the protective layer of diamond-like carbon as taught by Hajjar, in order to provide a smoother tribological interface to limit friction, wear and debris generation.

Allowable Subject Matter

8. Claims 23, 24 and 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is an examiner's statement of reasons for allowance:

In claim 23, the limitation of the near-field optical apparatus having the monolithic semiconductor substrate further comprises: a first conductivity-type semiconductor layer adjacent a first side of the semiconductor substrate; an first conductivity-type distributed Bragg reflector mirror stack adjacent the first conductivity-type semiconductor layer; a multiple quantum well active region layer adjacent the first conductivity-type distributed Bragg reflector mirror stack; a second conductivity-type distributed Bragg reflector mirror stack adjacent the multiple quantum well active region layer; an insulating layer adjacent the second conductivity-type distributed Bragg reflector mirror stack; and a metal layer adjacent the insulating layer, taken in conjunction with the limitations of claim 22, is not anticipated by, nor made obvious, over the prior art of record.

Point of Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimlien T Le whose telephone number is 703 305 3498. The examiner can normally be reached on M-F 8a.m-5p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on 703 305 6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kimlien Le
May 17, 2004

William Korzuch

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